Notes on Nests of the Chestnut Rail

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Abstract

We located five active, six recent and six derelict nests of the mangal-inhabiting Chestnut Rail on the southern side of Darwin Harbour during December 1994 and January 1995. The stick nests were up to 2.2 m above the ground and supported in various ways by trunks, branches or roots of mangroves. Nests were concentrated in mangal areas subject to less prolonged inundation, particularly stands of the Spurred Mangrove *Ceriops australis*, but usually close to mangal areas subject to more prolonged inundation. Clutch sizes of two and four were confirmed and the eggs are described. There were at least three breeding pairs of Rails in 18 ha, a density that may have been facilitated by the available juxtaposition of nesting and foraging habitat.

Introduction

The Chestnut Rail *Eulabeornis castaneoventris* is a large rail of tropical mangals (mangrove forests) in Australia and the Aru Islands, Indonesia. Remarkably little is known about the species, and few nests have ever been found (White 1917; Johnstone 1990; Marchant & Higgins 1993). Nevertheless, it is regarded as moderately common in the Kimberley mangals (Storr 1980; Johnstone 1990) and along sections of the Northern Territory coast (Storr 1977), an anomaly attributable to its shyness and the inhospitable nature and inaccessibility of much of its habitat (Pringle & Lindsey 1985). In this note we report on five active and twelve inactive nests found in mangals on the southern side of Darwin Harbour.

Methods

During December 1994 and January 1995 we spent 37.5 person-hours searching for and documenting nests of the Chestnut Rail in mangals lining the Blackmore River and its tributary, the Darwin River on the south-eastern side of Darwin Harbour (12°42′ S, 130° 57′ E). We searched for nests by walking, looking for bulky stick structures and investigating the relatively few places that might support such structures. When both present, we walked 20 to 50 m apart, depending on visibility. We variously followed a compass bearing, a river bank or a vegetation ecotone. When nests were found, information was collected about their habitat, site, structure and contents.

Much of our search effort (30.5 person-hours) was concentrated in the mangal on the east bank of a 1.2 km section of the Blackmore River, and we believe we found most of the nests in this area. This mangal varied from 60 to 400 m wide, and was estimated from the 1:10,000 map to cover 18 ha. Using a GPS navigator, the locations of most nests were plotted on a 1:10,000 map showing mangal boundaries.

Results

We found five active nests, six intact but apparently inactive nests, and six nests in various stages of dereliction. No Chestnut Rails (nor other birds) were observed at these nests. Nevertheless, we are confident in ascribing them all to the Chestnut Rail because of consistencies in, and uniqueness of, construction and placement, as well as the eggs (size, shape and colour), the presence of footprints around active nests, and because the Rails were heard calling near four of the active nests.

Nest density, sites and habitat

In the 18 ha mangal block on the Blackmore River, we found 14 nests, of which four were active and six were recent. On 1 January 1995 three active nests were observed, the fourth almost certainly being a replacement nest for one of these as it was found subsequently within 30 m of a previously active nest. Thus, assuming the species breeds in pairs, density was at least one breeding pair to 0.4 km of river bank (one side) or 0.33 birds per ha. These values are almost certainly underestimates.

All nests were in mangroves, either below or rarely in the lower part of the canopy (Table 1). Nests were supported either by large trunks, branches or roots, or most commonly by a collapsed leaning stem amongst sapling mangroves (Plate 2). Three old nests in the latter situation had collapsed. Foliage cover above the nests was estimated to vary from 30 to 100%.

Eight of fourteen nests (57%) for which the habitat was recorded were in stands dominated by the Spurred Mangrove *Ceriops australis*. The other six were at the upper edges of moister sites in pure stands of Stilt-rooted Mangrove *Rhizophora stylosa* (one nest) or mixed species stands that variously included the Rib-fruited Mangrove *Bruguiera exaristata*, the Slender-fruited Mangrove *B. parviflora*, *R. stylosa* and possibly other species. Although *C. australis* occurred in almost pure stands in broad bands up to 400 m from the river bank, all but one nest in *C. australis* stands were within 100 m of the river bank (we did search further afield). Most were within 20 m of moister, low-lying mangal – the *Bruguiera* and *Rhizophora* zones of Lear & Turner (1977).

PLATE 2 Typical nest of Chestnut Rail on leaning sapling of the Spurred Mangrove. The leaning sapling was used both as support for the nest and as a walkway to the nest. (T. Barnes)

TABLE 1 Summary of nest sites.

Parameters	No. of nests
Height above ground (m):	
median 1.85	
range 1.2–2.2	14
Nest plants (live, unless otherwise stated)	
Spurred mangrove *Ceriops australis*	6
Grey Mangrove *Avicennia marina*	3
Stilt-rooted Mangrove *Rhizophora stylosa*	2
unidentified mangrove, none of above	2
dead plants (unidentified mangroves)	3
Nest situation:	
amongst upright stems or foliage, supported by an angled fallen stem	9
on horizontal portion of stilt roots, against main trunk	2
in horizontal spout	1
in vertical spout	1
in hollow	1
in upright fork	1
on dead horizontal branch, against vertical trunk	1

Nest structure

Nests were bulky platforms, 25–50 cm in diameter and 17–50 cm high. Those in hollows and spouts were smaller than nests built in open situations. The egg cavity ranged from 13 to 25 cm in diameter, and from 1 to 5 cm in depth, and was invariably unlined (Plate 3).

Nests were composed predominantly or solely of mangrove sticks, sometimes with paperbark sticks, wood splinters, bark and a few mangrove leaves and seedlings (hypocotyls). Sticks were mostly 5–10 mm in diameter, with a range from 2 mm to about 20 mm; length was typically 15–40 cm. In two nests where a sample was measured (Table 2), stick diameter declined from the base to the cup. Stick length was greatest in the body of the nest, but shorter and similar at the base and cup. Sticks in the nest body were frequently forked and interlocked; those elsewhere rarely (if ever) so.

TABLE 2 Mean measurements of sticks (n = 10) from each of three sections of two nests of the Chestnut Rail.

Parameter	Stick diameter (mm)		Stick length (cm)	
	Nest 1	Nest 2	Nest 1	Nest 2
Base	13	8	19	13
Body	6	6	31	39
Cup	4	4	20	13

Four nests had gangways, stick constructions extending the nest downwards with the apparent function of facilitating access. However, on only one was this feature prominent, being 55 cm long and 36 cm wide. In the latter case, there was no alternative access pathway. A feature of active nests was the presence of muddy footprints on roots or leaning branches leading up to the nest. Only two nests, at 2.0 and 2.2 metres above the mud respectively, lacked an obvious pathway and may have required access by flight.

Clutch size and egg characteristics

Of five active nests, three contained two eggs, another had three eggs and the last, four eggs. Three of the nests were revisited, and two still contained eggs after intervals of eight and ten days. The third nest was empty, though it was unclear whether the eggs had been taken by a predator or had hatched successfully.

Eggs were moderately to heavily mud-smeared. The basal colour was matt to slightly lustrous cream, with small underlying lavender blotches and brown, tan and rich chestnut surface specks and blotches. In one clutch

the three eggs measured 53–54 x 35–35.5 mm, while in another clutch, one egg measured 46 x 35 mm.

Discussion

Our estimate of the density of breeding pairs is considerably greater than found in Western Australia, where Johnstone (1990) noted ten birds in 3 km and 8 birds in 100 ha (0.08 birds per ha) at two sites. It is consistent with Noske's (in Marchant & Higgins 1993) suggestion that territories may be of 4–5 ha, and W. McLennan's note (in White 1917) that birds "appear to be very local in their habits, and would always remain within a radius of 150 yards (c. 6 ha) of where they were first heard calling". Thus, suitable mangals can and do contain quite high densities of this species.

The scarcity of breeding records of the Chestnut Rail may be attributable not only to the inhospitable nature of mangals in general (Pringle & Lindsey 1985), but also to the concentration of nests deep within mangals (this note) and to the timing of breeding during the "build-up" and wet seasons (Pringle & Lindsey 1985; Storr 1977; Marchant & Higgins 1993) when observer activity may be low and the mangals particularly uninviting. We had little difficulty finding nests, an experience apparently matched only by W McLennan, who found many nests along the King River in Arnhem Land (White 1917).

PLATE 3 Nest of Chestnut Rail, with eggs. Note the shallow, unlined and in this case ill-defined bowl. (D. Franklin)

But what is a suitable mangal? There is a consensus that Chestnut Rails prefer broad bands of dense mangal, especially along the seaward margins or where interlaced with small channels (White 1917; Ragless 1977; Johnstone 1990; Noske 1996), a view consistent with our observations. This could be interpreted as a preference for moister soils inundated regularly and at length by tides, which is where their major food items, small crabs and crustaceans (Johnstone 1990; Marchant & Higgins 1993), are most abundant. However, low-lying mangals may be less suitable for nesting, for with high tides up to 8 m asl and a bulky nest requiring considerable support, suitable inundation-free sites may be lacking. We noted nests on higher ground but close to low-lying areas. The juxtaposition of moist foraging areas and secure nesting sites may be critical for the species, and suggests a readily testable hypothesis for variation in the density of nests and perhaps also of populations of the species.

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